SVIDERSKAYA, Z.A.

PHASE I BOOK EXPLOITATION SOV/3602

Akademiya nauk SSSR. Institut metallurgii

Issledovaniye splavov tsvetnykh metallov; sbornik 2 (Analysis of Nonferrous Metal Alloys; Collection of Articles, [No.] 2) Moscow, Izd-vo AN SSSR, 1960. 204 p. Errata slip inserted. 2,800 copies printed.

Ed.: I.A. Oding, Corresponding Member, USSR Academy of Sciences; Ed. of Publishing House: V.S. Rzhevnikov; Tech. Ed.: T.P. Polenova; Editorial Board: A.A. Bochvar, Academician; M.Ye. Drits, Candidate of Technical Sciences (Deputy Resp. Ed.); N.V. Zakharov, Professor, Doctor of Technical Sciences; E.S. Kadaner, Candidate of Technical Sciences (Resp. Secretary); A.M. Korol'kov, Doctor of Technical Sciences; M.V. Mal'tsev Professor, Doctor of Technical Sciences; and Z.A. Sviderskaya, Candidate of Technical Sciences.

PURPOSE: This collection of articles is intended for workers in scientific research institutes, metal and machine works, for teaching personnel, and for students attending schools of higher education.

COVERAGE: This is the second volume in a series of works on nonferrous and light-metal alloys prepared by the Institut metallurgii imeni A.A. Baykova AN SSSR (Institute of Metallurgy imeni A.A. Baykov of the Academy of Sciences USSR), and the Moskovskiy institut tsvetnykh metallov i zolota imeni M.I. Kalinina (Moscow Institute of Nonferrous Metals and Gold imeni M.I. Kalinin). The problems discussed concern the casting and physical metallurgy of nonferrous alloys. The effect of alloying and deformation on the properties of various alloys, and the problems connected with the study of the casting properties and with the plotting of phase diagrams for nonferrous alloys are discussed. No personalities are mentioned. References accompany most of the articles.

PHASE I BOOK EXPLOITATION SOV/4558
SOV/16-S-5

Akademiya nauk SSSR. Institut metallurgii

Metallurgiya, metallovedeniye, fiziko-khimicheskiye metody issledovaniya (Physicochemical Research Methods in Metallurgy and Metal Science) Moscow, Izd-vo AN SSSR, 1960. 251 p. (Series: Its: Trudy, vyp. 5) Errata slip inserted. 2,800 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut metallurgii imeni A.A. Baykova.

Resp. Ed.: I.P. Bardin, Academician (Deceased); Ed. of Publishing House: V.A. Klimov; Tech. Ed.: T.P. Polenova.

PURPOSE: This collection of articles is intended for metallurgists and metal researchers.

COVERAGE: The collection contains articles on metallurgy, metal science, and physicochemical research methods. Separate articles discuss the structure and properties of some metals and alloys. The effect of cold treatment and inclusions on the properties of alloys are analyzed, and instruments and

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PHASE I BOOK EXPLOITATION SOV/4164

Vsesoyuznoye soveshchaniye po splavam redkikh metallov. 1st, Moscow, 1957

Redkiye metally i splavy; trudy... (Rare Metals and Alloys; Transactions of the First All-Union Conference on Rare-Metal Alloys) Moscow, Metallurgizdat, 1960. 438 p. 3,150 copies printed.

Sponsoring Agencies: Akademiya nauk SSSR. Institut metallurgii; USSR Komissiya po redkim metallam pri nauchno-tekhnicheskom komitete.

Ed.: I.K. Shapovalov; Ed. of Publishing House: O.M. Kamayeva; Tech. Ed.: P.G. Islent'yeva.

PURPOSE: This collection of articles is intended for metallurgical engineers, physicists, and workers in the machine-building and radio-engineering industries. It may also be used by students of schools of higher education.

COVERAGE: The collection contains technical papers which were presented and discussed at the First All-Union Conference on Rare-Metal Alloys, held in the Institute of Metallurgy, Academy of Sciences USSR in November 1957. Results of investigations of rare-metal alloys, titanium, and copper-base alloys with additions of rare metals are presented and discussed along with investigations of rhenium, vanadium, niobium, and their alloys. The effect of rare-earth metals on properties of magnesium alloys and steels is analyzed. The uses of rhenium as a dehydrating catalyst, electroplating material, and material suitable for making plugs for automobile electrical systems are discussed. Also, the effect of the addition of certain elements on the properties of heat-resistant steel is examined and alloys with special physical properties (particularly semiconductive alloys) are discussed. No personalities are mentioned. Soviet and non-Soviet references accompany some of the articles.

PART II. TITANIUM, AND COPPER-BASE ALLOYS WITH RARE-METAL ADDITIONS

Rare Metals (Cont.) SOV/4164

Card 6/8

Sviderskaya, Z.A.

18.1210

77733
SOV/149-60-1-22/27

AUTHORS: Zakharov, M. V., Sviderskaya, Z. A., Kadaner, E. S., Turkina, N. I.

TITLE: Effect of Copper and Magnesium on Properties of Aluminum-Manganese Alloys at Room and Elevated Temperatures

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Tsvetnaya metallurgiya, 1960, Nr 1, pp 145-149 (USSR)

ABSTRACT: A highly alloyed heat-resistant metal containing many excess phases is usually low-melting and cannot be recommended for the highest working temperatures. Conversely, if an alloy has a high mp, and a moderate number of excess phases, it will also be heat-resistant at adequately high working temperatures. From this point of view it was interesting to study the influence of a variable addition of s-phase (Al_2MgCu) on heat resistance of high-melting Al-Mn

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(1.5% Mn) alloy. Cu and Mg content varied from 1.3 to 4.5 and from 0.5 to 2%, respectively. Alloy "A", free of these metals, and alloy VD17 (2.9% Cu, 2.2% Mg, 0.57 Mn, the rest Al) were also tested for comparison. Up to 0.1 Ti was added for finer grain structure. Ingots were cast in a water-cooled dipped mold, the specimens (10.5 mm rods) were extruded (in a 100 ton press) after 48 hr homogenizing at 480° C. Temperature of container was 400-420° C. Subsequent heat treatment comprised quenching in water from 500° C and artificial aging for 6 hr at 190° C. Samples to be tested for heat resistance were conditioned for 100 hr at the temperature of the test. The results of tests are shown in Table 1 and in Figs. 1 and 2.

Effect of Copper and Magnesium on Properties of Aluminum-Manganese Alloys at Room and Elevated Temperatures

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A	B	ALLOY A (1,5% Mn, 0,3% Fe, 0,3% Si, 0,1% Ti, REST Al)	A + 1,3% Cu + 0,5% Mg (2,8% S-PHASE)	A + 2,5% Cu + 1,0% Mg (5,5 % S-PHASE)	A + 3,5% Cu + 1,5% Mg (7,8% S-PHASE)	A + 3,5% Cu + 2,0% Mg (10% S-PHASE)	ALLOY VD 17 (2,9% Cu, 2,2% Mg, 0,57% Mn, REST Al)
E	20	6,5	12,5	29,0	36,5	41,5	37,0
	200	3,0	7,5	20,0	18,5	21,0	20,5
	250	3,5	8,0	13,0	12,0	3,0	13,5
	300	3,5	4,5	8,0	6,5	7,0	7,0
F	20	34,5	20,0	11,0	7,0	7,0	10,0
	200	32,0	31,0	29,0	21,5	21,5	19,0
	250	33,5	35,0	29,0	19,5	20,5	23,5
	300	36,0	35,0	30,0	26,5	26,0	30,0

Key to Table 1: (A) Properties; (B) Test temperature, °C; (C) Hardness (H_b), kg/mm^2; (D) Tensile strength (σ_b) kg/mm^2; (E) Yield point ($\sigma_{0,2}$) kg/mm^2; (F) Elongation (δ) %; (G) Remark: action time of indenter: (1) 30 sec, (2) 60 min.

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Effect of Copper and Magnesium on Properties of Aluminum-Manganese Alloys at Room and Elevated Temperatures

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SOV/149-60-1-22/27

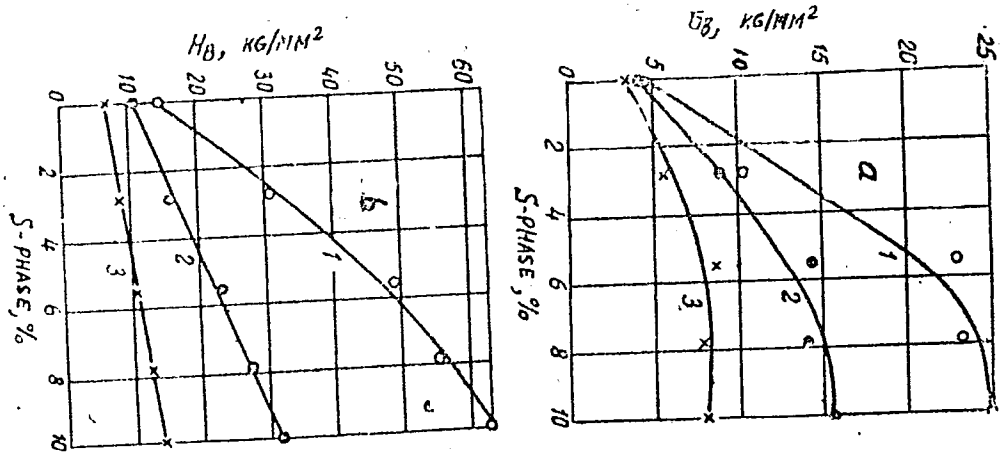

Fig. 2. Effect of s-phase content on tensile strength (a) and ultimate hardness (b) of Al-Mn alloy at elevated temperatures: (1) 200° C; (2) 250° C; (3) 300° C.

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Effect of Copper and Magnesium on Properties of Aluminum-Manganese Alloys at Room and Elevated Temperatures

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The authors conclude that the optimum results (for 100 hr at 250° C) were shown by an aluminum alloy with 1.5% Mn and 7.8% s-phase (3.5% Cu and 1.5% Mg), meaning that moderate alloying by this binary phase results in higher characteristics than a 10% addition. There are 2 tables; 4 figures; and 7 Soviet references.

ASSOCIATION: Institute of Metallurgy, AS USSR and Krasnoyarsk Institute of Nonferrous Metals (Institut metallurgii AN SSSR i Krasnoyarskiy institut tsvetnykh metallov)

SUBMITTED: April 15, 1959

Card 8/8

BOCHVAR, A.A., akademik; SVIDERSKAYA, Z.A., kand.tekhn.nauk

Investigating softening processes in low-melting point eutectics. Issl.splav.tsvet.met. no.2:3-8 '60. (MIRA 13:5)

(Nonferrous alloys--Testing) (Melting points)

DRITS, M.Ye., kand.tekhn.nauk; SVIDERSKAYA, Z.A., kand.tekhn.nauk; VASHCHENKO, A.A.; KADANER, E.S., kand.tekhn.nauk

Comparative investigation of the heat resistance of MA8 and MA9 magnesium alloys. Issl.splav.tsvet.met. no.2:30-32 '60. (MIRA 13:5)

(Magnesium alloys--Testing)

SVIDERSKAYA, Z.A., kand.tekhn.nauk; DRITS, M.Ye., kand.tekhn.nauk; VASHCHENKO, A.A.; ROKHLIN, L.L.

Effect of cold deformation on the properties of certain aluminum alloys hardened by heat treatment. Issl.splav.tsvet. met. no.2:67-71 '60. (MIRA 13:5)
(Aluminum alloys--Cold working)

SVIDERSKAYA, Z.A., kand.tekhn.nauk; ROKHLIN, L.L.

Effect of cold deformation on the mechanical properties of Al-1.50% Mg_2Si in various conditions of aging. Issl.splav. tsvet.met. no.2:84-91 '60. (MIRA 13:5)
(Aluminum alloys--Cold working)

89632

18.1245

S/509/60/000/004/004/024
E021/E106

AUTHORS: Drits, M.Ye., Mal'tsev, M.V., Sviderskaya, Z.A., and Padezhnova, Ye.M.

TITLE: Alloys of Magnesium Containing Thorium

PERIODICAL: Akademiya nauk SSSR. Institut metallurgii. Trudy, No.4, 1960. Metallurgiya, metallovedeniye, fiziko-khimicheskiye metody issledovaniya, pp. 74-83

TEXT: Several binary and ternary magnesium-thorium alloys have been investigated using additions of manganese, cerium, aluminium, zinc, calcium and zirconium. The properties of magnesium-thorium alloys and also the effects of the additions on the properties at both room and elevated temperature were examined. The alloys were cast in a 20 mm diameter metallic mould heated to 50-60 °C. The main method of investigating the properties consisted of short-time (30 sec) and long-time (60 min) hardness measurements. The hardnesses were measured at room temperature and 300 °C using a 10 mm ball and a 100 kg load. The alloys were stabilised at 300 °C for 100 hours before testing. Measurements were also made after quenching from 565 °C. A marked increase

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E021/E106

Alloys of Magnesium Containing Thorium

occurred in the hardness of magnesium in the cast and stabilised conditions with increase in thorium content to 4%. Further increases in thorium content to 6-10% had not much effect. The hardness decreased somewhat after the stabilisation treatment. After quenching the alloys from 565 °C, the hardness increased with increasing thorium content up to 10%. The prolonged hardness gave extremely high values. From microstructural and thermal analysis it was shown that the magnesium-thorium system is of the eutectic type. The eutectic consists of α-solid solution and the compound Mg_5Th, melting at 40-42% thorium and 580 °C, (Fig.2). The solubility of thorium at the eutectic temperature is 5% and at 300 °C, 0.5%. Microhardness measurements showed that the hardness of the compound was 306 kg/mm^2, the eutectic was 118 kg/mm^2, and the solid solution was 74 kg/mm^2, corresponding to a hardness for magnesium of 47 kg/mm^2. The effect of the additions of the various elements was studied using an alloy containing 3% thorium. Cerium had the greatest effect on the properties at room temperature, the hardness continuously increasing up to 6% cerium.

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Alloys of Magnesium.....

Calcium and zinc had a positive effect up to 0.5-1%, further additions showing no change. Low additions of manganese and aluminium gave a decrease in hardness. Further additions gave an increase. The greatest effect on the prolonged hardness at 300 °C was shown by 0.6-1% manganese. Cerium also showed an increase, but to a lesser degree.
There are 5 figures, 6 tables and 3 English references.

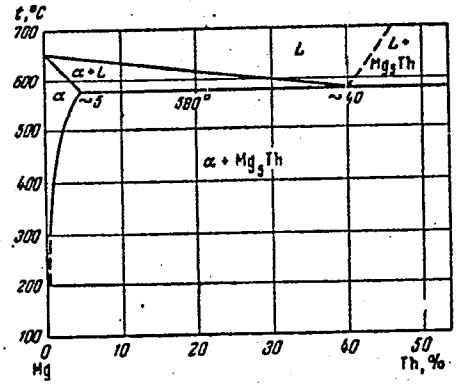

Рис. 2. Диаграмма состояния сплавов Mg — Th

Fig.2

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82623

S/180/60/000/004/018/027
E193/E483

18.1245

AUTHORS: Drits, M.Ye., Sviderskaya, Z.A. and Turkina, N.I. (Moscow)

TITLE: On Softening of Chemical Compounds in Magnesium Alloys at Elevated Temperatures

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1960, No.4, pp.111-119

TEXT: The behaviour of alloys at elevated temperatures is determined by the properties of both the solid solution matrix and the second phases (intermetallic compounds, solid solutions or grains of pure metals) as well as by the interaction between the matrix and the dispersed strengthening phases. The object of the investigation, described in the present paper, was to study the effect of time and temperature on the properties of intermetallic compounds, formed in Mg-base alloys, by measuring their micro-hardness at temperatures between 20 and 300°C. In addition to manganese, microhardness of the following compounds was determined: Al_2Ca, MgZn, Mg_5Th, Mg_xNd_y, $Mg_{17}Al_{12}$, Mg_9Cl, Mg_2Ca. At each temperature, two hardness measurements were taken with the load of

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E193/E483

On Softening of Chemical Compounds in Magnesium Alloys at Elevated Temperatures

20 g applied for 0.5 and 60 min. The results are reproduced in Table 1. It will be seen that the effect of temperature on hardness is not the same for all the phases studied. The intermetallic compounds $Mg_{17}Al_{12}$, Mg_2Ca and MgZn lose their hardness quite rapidly, the softening effect of heating being most pronounced in the compound formed by magnesium and zinc, whose microhardness is reduced considerably already at 150°C. The difference between the microhardness of the MgZn compound, determined at 150°C, with the load applied for 0.5 and 60 min, amounts to more than 100 kg/mm^2. The temperature dependence of microhardness of the compounds of magnesium with Th, Cl and Nl is represented by the curves with a lower angle of slope. On heating to 200°C the difference between short-term and long-term microhardness of these compounds amounts only to 30 to 40 kg/mm^2, as against the difference of 50 to 70 kg/mm^2 in the case of the $Mg_{17}Al_{12}$ and Mg_2Ca compounds. Microhardness of the Mn grains falls with rising temperature at a rate similar to that observed in the Mg_5Th, Mg_9Cl and Mg_xNl_y compounds, although the

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On Softening of Chemical Compounds in Magnesium Alloys at Elevated Temperatures

absolute values of microhardness of Mn are considerably higher. The least affected by the increase in temperature is the Al_2Ca compound. The effect of heating on microhardness of the investigated compounds is shown even more clearly in Table 2, which shows the % reduction in long-term microhardness at room temperature on heating to 150, 200, 250 and 300°C. On the basis of data reproduced in Table 2, it can be concluded that the investigated compounds can be divided into two groups: (1) heat-resistant phases such as the Al_2Ca, Mg_5Th, and Mg_9Cl compounds and the Mn grains which, on heating to temperatures up to 300°C, lose less than 50% of their original hardness and (2) heat-sensitive phases such as the $Mg_{17}Al_{12}$, Mg_2Ca and MgZn compounds whose hardness, on heating to 300°C, is reduced by 70 to 90%. Correlation of the data, obtained in the course of the present investigation, with the known effect of temperature on strength of various Mg-base alloys, leads to the conclusion that the properties of these alloys are, to a great extent, determined by the properties of the second phases present in these alloys.

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On Softening of Chemical Compounds in Magnesium Alloys at Elevated Temperatures

The object of the next series of experiments was to compare the properties of the Mg_5Th, Mg_9Ce and $Mg_{17}Al_{12}$ compounds with those of the corresponding solid solutions, i.e. the 10% Al-Mg, 4% Th-Mg, and 1% Ce-Mg alloys, tested after quenching from 420, 590 and 575°C, respectively. The results are reproduced in Fig.2, where microhardness, measured with the load applied for 60 min, is plotted against temperature. It is inferred from these results that the phases, precipitated during decomposition of super-saturated solid solutions or during recrystallization, play an important part in determining the properties of these alloys. In systems in which heat-resistant phases are present, their hardness at high temperatures is considerably higher than that of the solid solution matrix and, consequently, they may display a strengthening effect, even at relatively high temperatures. In systems containing heat-sensitive phases, whose hardness at high temperatures is the same, or nearly the same, as that of the matrix, the presence of these phases brings about no improvement in the creep properties of the alloys. In the final chapter of the paper, an attempt is made to

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On Softening of Chemical Compounds in Magnesium Alloys at Elevated Temperatures

correlate the results of the present investigation with other properties of the substances studied, such as their crystal structure, type of the chemical bond and melting point (see Table 3). There are 2 figures, 3 tables and 28 references: 21 Soviet and 7 English.

SUBMITTED: April 11, 1960

Card 5/5

DRITS, M.Ye.; SVIDERSKAYA, Z.A.; ROKHLIN, L.L.

Investigating the characteristics of the manganese phase of certain manganese-base alloys. Trudy Inst.met. no.5:85-94 '60.
(MIRA 13:6)

(Manganese alloys--Metallography)

SVIDERSKAYA, Z.A.; VASHCHENKO, A.A.

Effect of cold deformation on the properties of aluminum-copper and aluminum-copper-magnesium alloys under various conditions of aging. Trudy Inst.met. no.5:95-99 '60. (MIRA 13:6)
(Aluminum-copper alloys--Cold working)

SVIDERSKAYA, Z.A.

PHASE I BOOK EXPLOITATION SOV/5869

Drits, Mikhail Yefimovich, Zoya Andreyevna Sviderskaya, and Esfir' Solomonovna Kadaner

Avtoradiografiya v metallovedenii (Autoradiography in Metal Science) Moscow, Metallurgizdat, 1961. 170 p. 3700 copies printed.

Ed.: L.M. Mirskiy; Ed. of Publishing House: Ye.I. Levit; Tech. Ed.: A.I. Karasev.

PURPOSE: This book is intended for technical personnel of metallurgical and metalworking plants and scientific research institutes. It may also be used by students at special schools of higher education.

COVERAGE: The book describes the autoradiographical method for the investigation of certain problems in metal science. A brief discussion of the physical fundamentals of autoradiography is presented. Particular attention is given to the

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application of this method for studying the processes of crystallization, modification, and the distribution of alloying elements and impurities in alloys. Problems connected with the use of this method for studying the redistribution of alloying elements in alloys taking place under the effect of deformation and heat treatment are discussed. Also included are data on the relationship between the distribution of alloying elements and the strength characteristics of alloys at room or elevated temperatures. No personalities are mentioned. There are 159 references, mostly Soviet.

TABLE OF CONTENTS:

34710
S/137/62/000/002/064/1[illegible]
A006/A101

18.1245

AUTHORS: Drits, M. Ye., Sviderskaya, Z. A., Kadaner, E. S., Sinel'nikova, A. A.

TITLE: Recrystallization and softening of magnesium alloys with manganese, aluminum and calcium at higher temperatures

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 2, 1962, 20, 2I120 ("Izv. AN SSSR, Otd. tekhn. n.", 1961, no. 4, 103 - 110)

TEXT: The authors investigated the effect of Mn (0.1 - 2%), Al (0.1 - 10%) and Ca (0.05 - 1.5%) on recrystallization of Mg. Ingots 10 mm thick, cast into metal molds were rolled in hot state at 430°C until 75% deformation. Sheet blanks were then rolled with 60% reduction until about 1 mm sheet thickness. Such deformation conditions were selected that recrystallization could not occur during the processing; this was checked by X-rays. Recrystallization was studied by measuring hardness, and by microscopical and X-ray analyses. A higher Mn content raises the temperature of beginning and completed recrystallization; the most intensive rise takes place at up to 0.5% Mn concentration. Addition of Al reduces sharply the temperature of beginning and terminated recrystallization, and

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18.1210 2408, 2808, 2208, 1413 25549

S/149/61/000/004/006/008
A006/A101

AUTHORS: Zakharov, M. V.; Sviderskaya, Z. A.; Kadaner, E. S.; Turkina, N. I.

TITLE: The effect of lithium on the properties of aluminum-manganese alloys at room and elevated temperatures

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Tsvetnaya metallurgiya, no. 4, 1961, 134-138

TEXT: The authors studied the possibility of improving the properties of an aluminum-manganese alloy, by alloying it with lithium. Lithium forms with aluminum a rather extended zone of solid solutions and the solubility of lithium in solid aluminum decreases from 6.4 to 1.5% at temperatures dropping from 601 to 15°C. This indicates the possibility of heat treatment for these alloys. Investigations were made with Al alloys containing 1.5% manganese; 0.1% titanium; 0.3% iron and silicon each, and from 0.5 to 3.0% lithium. Optimum heat treating conditions were selected by measuring the hardness of the alloys in hot-pressed state; in water-quenched state after heating in a saltpeter bath at 600°C for 1 hour; after 5-day natural aging and after 10-day artificial aging at 150-250°C.

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25549 S/149/61/000/004/006/008
A006/A101

The effect of lithium on the properties ...

The properties of the alloys were studied by short-time tension at room and elevated temperatures (200, 250 and 300°C), and by the method of hot and long-lasting hardness. Specimens intended for high-temperature tests were subjected, in addition to heat treatment under optimum conditions (quench hardening at 600°C for 1 hour and artificial aging at 195°C for 6 hours), to 100-hour stabilization. The results obtained show that only alloys containing 2 - 3% Li are hardened by heat treatment. Heating to 250 and 300°C reduced the hardening effect of lithium. This is probably caused by coagulation processes of the hardening phase, developing at these temperatures. Strength properties of alloys with 3% Li approach those of Al-Cu-Mg alloys. Comparison tests showed the expediency of heat treatment for artificially aged alloys with 3% Li whose hardness exceeded that of not heat-treated hot-pressed alloys by 10 kg/mm^2. It is concluded that one of the basic factors of hardening the Al-Mn-Li alloy at elevated temperatures, is the development of a submicroscopical heterogeneity of the structure on account of dispersional precipitation of the hardening phase during the decomposition of the ternary solid solution, rich in aluminum. Apparently the hardening lithium phase has sufficiently stable properties at elevated temperatures and low proneness to coagulation when heated not over 200°C. This article was recommended for publication by the kafedra metallovedeniya Krasnoyarskogo instituta tsvetnykh metallov

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25549

The effect of lithium on the properties ... S/149/61/000/004/006/008/ A006/A101

(Department of Metal Science at the Krasnoyarsk Institute of Non-Ferrous Metals). There are 3 tables, 5 figures, and 9 references: 4 Soviet-bloc and 5 non-Soviet-bloc. The reference to the most recent English-language publication reads as follows: P. Frost, Techn. Rev. 8, no. 1, 1959)

ASSOCIATIONS: Institut metallurgii AN SSSR (Institute of Metallurgy of AS USSR); Krasnoyarskiy institut tsvetnykh metallov (Krasnoyarsk Institute of Non-Ferrous Metals)

SUBMITTED: June 27, 1960

Card 3/3

DRITS, M.Ye.; SVIDERSKAYA, Z.A.; ROKHLIN, L.L.

Role of addition elements in the hardening of alloys in the system Mg - Mn - Al - Ca at high temperatures. Trudy Inst. met. no.8:111-119 '61. (MIRA 14:10)
(Magnesium-manganese-aluminum alloys--Hardening)
(Metals at high temperatures)

35776

S/180/62/000/001/012/014
E040/E135

18 1710

AUTHORS: Sviderskaya, Z.A., and Turkina, N.I. (Moscow)

TITLE: Phase softening in aluminium-copper-lithium alloys

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i toplivo, no.1, 1962, 151-155 + 1 plate

TEXT: Aluminium-copper-lithium alloys have recently become of a considerable industrial importance because of the good strength properties at room and elevated temperatures (200-250°C). In order to elucidate the high strength properties of Al-Cu-Li alloys at elevated temperatures, it is of interest to examine the heat resistance properties of the phases existing in these alloys side by side with the strengthening phases in the more common aluminium alloys of the type of Duraluminium. The purpose of the present investigation was to examine the binary Al_2Cu and AlLi compounds, ternary compounds of Al_2CuMg (S-phase), Al_2CuLi (T_1), $Al_{7.5}Cu_4Li$ (T_B), Al_6CuLi_3 (T_2) ternary aluminium-base solid solutions in the alloys with 94% Al, 4% Cu, remainder

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45225

S/806/62/000/003/001/018

AUTHORS: Bochvar, A. A., Sviderskaya, Z. A., Lazarev, G. P.

TITLE: Effect of the purity of the parent metal on the heat-resistance of an alloy.

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Issledovaniye splavov tsvetnykh metallov. no. 3. 1962, 5-11.

TEXT: Earlier investigations of the senior author and others (Akad. n. SSSR, Otd. tekhn. nauk, no. 2, 1954, 42-45 and 46-51) have shown that the heat-resistance of an alloy can be either enhanced or lowered by identical impurities present in different proportion, depending on whether the solidus T is raised or lowered by the predominant impurity. Matters become yet more complicated when the impurities form readily fusible components in the alloy and reduce the solidus T sharply, whereupon some of the heat-resistance (HR) characteristics, such as the long-term hardness, on which the properties of thin boundary layers have little effect, may not be altered, whereas the fundamental HR characteristics (long-term stress-rupture limit and fracture time at a given tensile stress) may be reduced to a mere fraction. The present paper describes tests intended to clarify the effect of impurities on the HR of the parent metal, in which two series of Al-Cu alloys were prepared: Series I based on 99.99% pure Al and Series II based on ordinary technical

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Al (99.7% Al, 0.11% Fe, 0.13% Si). Two sets of HR tests were made: (1) Long-term hardness (LTH) was determined by 1-hr loading of a 10-mm diam steel ball under a 100-kg load at 300°C; (2) stress-rupture strength (SRS) was determined by the failure time under a 1.5-kg/mm^2 stress at 300°. The tests were preceded by 100-hr soaking at test T. In both tests the technical-Al alloy was found to be significantly stronger than the pure-Al alloy. The effects of an introduction of Cu were overshadowed by those of the Fe and Si, since the latter affect the structure of the alloy and the recrystallization processes therein. Metallographic observations are reported and depicted photographically. Specimens cast onto a cold plate exhibited a dendritic structure which became more sharply defined as the amount of impurities increased. Also, the purer Al (99.99% and 99.999%) develops two mutually intersecting networks of crystallite boundaries, whereas the 99.7% Al manifests only a single such network. Although the cooling of the cast metal proceeded very quickly, the recrystallization occurred extremely fast (of the order of 1 mm/sec) in the purest Al, but appeared to be effectively inhibited by even a 0.3% total of impurities. It was thus postulated that the changes in heat-resistance were somehow related to the recrystallization process. Tests with casting done on a plate heated to 300°C did not effect any noticeable development of the recrystallization process in the 99.7% Al, but accelerated it appreciably in the 99.999% Al. Casting of two Al-Cu alloys on a cold plate produced practically identical single-network structures, but

SVIDERSKAYA, Z.A.; DRITS, M.Ye.; VASHCHENKO, A.A.

Effect of cold deformation on the properties of artificially aged aluminum alloys at high temperatures. Issl. splav. tsvet. met. no.3:48-57 '62. (MIRA 15:8)
(Aluminum alloys--Cold working)
(Metals at high temperatures)

S/806/62/000/003/007/018

AUTHORS: Drits, M. Ye., Sviderskaya, Z. A., Rokhlin, L. L.

TITLE: Investigation of the decomposition of a supersaturated solid solution of neodymium in magnesium.

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Issledovaniye splavov tsvetnykh metallov. no.3. 1962, 68-74.

TEXT: The paper describes an experimental investigation of the decomposition of the supersaturated solid solution of Nd in Mg during artificial aging after quenching, a procedure which yields maximal hardness at room T and up to 250°C. Because of the substantial chemical similarity of the rare-earth elements having an identical structure of the outer electron shells, the investigation of the aging behavior of Nd was made in comparison with that of the widely utilized Ce. The two comparison alloys were prepared in an electric resistance furnace with steel crucibles. Two Nd-containing alloys (1.1% Nd and 2% Nd) and a 2.4%-Ce alloy were prepared. Rods 10.5-mm diam were hot-extruded; the Mg-Nd alloys were water quenched at 535°C, the Ce alloy at 575°. The pre-quench heating was performed by 4-hr soaking in a sulfurous atmosphere. The study of the aging process comprised a comparison of the changes in hardness (H_V), specific electrical resistance, and

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microstructure. X-ray metallography was not effective since the formation of the Mg-Nd solid solution produces only a relatively small change in lattice parameter because of the small solubility (in at.-%) of Nd in Mg. 2- to 100-hr aging of the 1.1% Nd alloy was performed at 150, 175, 200, 250, and 300°C. Curves reveal a H_V maximum at a fairly constant H_V level up to 200°, but which is attained after aging times that decrease with increasing T, and with H_V values decreasing both in value and in time of attainment at higher T. The resistance (R) measurements show a drop in R with aging time and an increase in steepness of the drop with aging T. This drop in R is attributed to a segregation from the supersaturated solid solution of particles of a second Nd-rich phase. No "first-stage" aging phase accompanied by an increase in R, comparable to that of Al alloys, is observed. Verification tests comparing the hardness and the R of specimens aged at room T and briefly at 150°C showed that an increase in H_V occurred only in conjunction with a drop in R, which indicates that in the aging of Mg-Nd alloys the hardening is attributable solely to the segregation of crystals of a Nd-rich phase from the supersaturated solid solution. Microscopically the segregation of the second-phase particles required much more time to become evident than did the R-drop indication. The first Nd-rich crystals appeared predominantly along the grain boundaries, but subsequent crystals could be identified even within the solid-solution crystals. The growth of the crystals became more pronounced with increasing T and lengthening aging time; it was more

S/123/62/000/023/004/008
A004/A101

AUTHORS: Sviderskaya, Z. A., Barsukova, T. A., Kuz'mina, V. I., Bochvar, N.R.

TITLE: The properties of aluminum alloys containing lithium

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 23, 1962, 17, abstract 23A122 (In collection: "Issled. splavov tsvetn. metallov". 3. Moscow, AN SSSR, 1962, 75 - 85)

TEXT: The authors present the results of investigating the effect of Li-additions (2 - 3%) on the properties of binary, ternary and more complex aluminum alloys. It is shown that, if the Li-concentration is increased to 2 - 3%, the strength characteristics of Al-Cu-Li alloys decrease with a simultaneous drop of elongation. The addition of Mn to these alloys increases both the strength and the elongation. Alloys containing Mn possess best properties at elevated temperatures. Thus the long-life strength σ_{100} of Al-alloys containing 4% Cu, 2% Li and 0.6% Mn amounts to 13 kg/mm^2 at 250°C. There are 18 references.

[Abstracter's note: Complete translation]

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DRITS, M.Ye.; MAL'TSEV, M.V.; SVIDERSKAYA, Z.A.; PADEZHNOVA, Ye.M.; TROKHOVA, V.F.

Effect of additional alloying on the properties of alloys in the system Mg - Th - Mn. Issl. splav. tsvet. met. no.3:86-92 '62. (MIRA 15:8)
(Magnesium-thorium-manganese alloys)

S/149/62/000/003/006/011
A006/A101

AUTHORS: Drits, M. Ye., Sviderskaya, Z. A., Rokhlin, L.L.

TITLE: The effect of some elements upon the mechanical properties of magnesium-neodynium alloys

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Tsvetnaya metallurgiya, no. 3, 1962, 117 - 121

TEXT: The investigation was made with magnesium-neodymium alloys in deformed state. Grade Mg1 magnesium (99.91% Mg), magnesium-neodymium addition-alloy, and magnesium addition-alloy with other metals, were used as charge materials for preparing the alloys to be investigated. The following components were added: cadmium, lithium, aluminum, zinc, tin, bismuth, calcium, manganese, silicon, barium and cobalt. The alloys were heat-treated by quenching and artificial aging. The quenching temperature for the alloys was 535°C, with the exception of Zn and Ca (435 - 515°C). The specimens were quenched for 4 hours in sulfur dioxide atmosphere and air-cooled. Aging was performed at 175°C for 24 hours. The tests show that none of the alloying components used caused a sub-

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S/129/62/000/011/006/007
E073/E535

AUTHORS: Drits, M.Ye., Sviderskaya, Z.A. and Kadaner, E.S., Candidates of Technical Sciences and Fel'gina, S.B., Engineer

TITLE: Influence of manganese, aluminium and calcium on the kinetics of recrystallization of magnesium

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, no.11, 1962, 28-31

TEXT: The kinetics of recrystallization were studied for magnesium and magnesium alloys with 0.05-0.09 and 0.9 at.% Mn, Al and Ca produced from 99.91% pure magnesium, 99.98% pure aluminium, sublimated calcium and Mg-Mn alloy. Ingots weighing 0.5 kg from chill moulds were subjected to rolling in two passes. The final rolling was with a reduction of 60% after heating the blanks to 300°C. The conditions of deformation were chosen to prevent recrystallization and to obtain a high quality, crack-free material. Subsequent annealing was at 65-275°C for durations of between 1 min and 40 hours. The kinetics of recrystallization were studied by subjecting an annealed specimen to local

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deformation, i.e. by indenting with a ball using a hardness-test instrument, followed by annealing at various temperatures; the process of recrystallization was investigated by observing the formation of the finest grains in the indented zone. The time until recrystallization commences decreases with increasing annealing temperature; for magnesium this time decreases from 10 hours to a few minutes on increasing the annealing temperature from 65 to 150°C. For alloys with 0.1 wt.% Mn or Al the decrease is from 13 and 18 hours, respectively, to 3 min if the annealing temperature is increased from 75 to 150°C. The activation energy of pure magnesium was determined as being 17.5 kcal/g·atom, which is about half the published value (32 kcal/g·atom) of the activation energy of self-diffusion. This leads to the conclusion that the mechanism of recrystallization differs from the mechanism of self-diffusion. In the case of low contents of alloying elements, an increase of the time until recrystallization commences corresponds to an increase in the activation energy, whereby the maximum increase in the activation energy occurs when magnesium is alloyed with calcium, which has the strongest braking effect on crystallization. An increase in the

content of the alloying element did not affect the increase in the activation energy of Mg-Al alloys and, in the case of Mg-Mn and Mg-Ca alloys, it even reduced it somewhat. This differing behaviour is attributed to the differing ratios of the atomic dimensions of the alloying elements and the base metal. This dimensional factor also determines the interaction of the components, particularly the limit solubility in the solid state. The braking of the recrystallization process will be the more intensive the lower the solubility of the element in solid magnesium. The presence in the structure of particles of other phases also causes some braking of the process of recrystallization. However, the effect of the alloying element basically manifests itself at concentrations at which the element enters into the solid solution. There are 3 figures and 1 table.

ASSOCIATION: Institut metallurgii imeni A. A. Baykova
(Institute of Metallurgy imeni A. A. Baykov)

DRITS', M.Ye. (Moskva); SVIDERSKAYA, Z.A.(Moskva); ROKHLIN, L.L. (Moskva)

Hardening of alloys in the system magneisum - neodymium by means of thermomechanical treatment. Izv. AN SSSR.Otd.tekh.nauk. Met. i topl. no.5:191-196 S-O'62. (MIRA 15:10)
(Magnesium-neodymium alloys--Hardening)

DRITS, M. Ye. (Moskva); SVIDERSKAYA, Z. A. (Moskva); KUZ'MINA, V. I. (Moskva)

Effect of iron, silicon, and manganese on the properties of aluminum-copper-lithium alloys. Izv. AN SSSR. Otd. tekh. nauk. Met. i topl. no.6:150-158 N-D '62.
(MIRA 16:1)

(Aluminum-copper-lithium alloys—Testing)

DRITS, M.Ye., kand.tekhn.nauk; SVIDERSKAYA, Z.A., kand.tekhn.nauk; KADANER, E.S., kand.tekhn.nauk; FEL'GINA, S.B., inzh.

Effect of manganese, aluminum, and calcium on the kinetics of magnesium recrystallization. Metalloved. i term. obr. met. no.11:28-31 N '62. (MIRA 15:11)

1. Institut metallurgii imeni A.A. Baykova.
(Magnesium alloys--Metallography)
(Crystallization)

S/509/62/000/011/009/019
E071/E351

AUTHORS: Drits, M.Ye., Sviderskaya, Z.A., Rokhlin, L.L., Padezhnova, Ye.M. and Yakovleva, L.I.

TITLE: The relationship between strength at elevated temperature and composition of magnesium-base alloys

SOURCE: Akademiya nauk SSSR. Institut metallurgi. Trudy. no. 11. Moscow, 1962. Metallurgiya, metallovedeniye, fiziko-khimicheskiye metody issledovaniya. 124 - 132

TEXT: A study of the relationship between composition and strength at high temperatures for deformed and heat-treated magnesium alloys was carried out, as the only available data covered a limited number of alloys, in the cast state. The binary alloys investigated over a temperature range of 150 - 300 °C were: Mg-Al; Mg-Zn; Mg-Mn; Mg-Th; Mg-Ce; Mg-Nd and Mg-Ca. Cast ingots, after cleaning by machining, were pressed into rods, 10.5 mm in diameter, being deformed by 88%. The Mg-Al and Mg-Zn alloys were homogenized before pressing (at 400 and 340 °C, respectively) for 50-60 hours; the remaining alloys were not homogenized. The pressing temperature was 300 - 440 °C, the temperature

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The relationship between ....

of the container being 250 - 400 °C. Specimens prepared from these rods were hardened in water at 60 - 70 °C, Mg-Al from 415 °C, Mg-Zn from 315 °C, Mg-Mn, Mg-Th and Mg-Ce from 550 °C, Mg-Nd from 520 °C and Mg-Ca from 490 °C, following which they were stabilized at the test temperature for 100 hours. The strength-testing of the alloys at elevated temperatures was carried out by determination of the hardness under prolonged loading (hours). The results showed that the best structure for obtaining the maximum heat-resistance would be different for each system, depending on the nature of the intermetallic components. In systems having a high solubility of the alloying element in solid magnesium and marked changes in solubility with temperature, the best structure is a highly-alloyed solid solution (Mg-Al, Mg-Zn). This is particularly the case at higher temperatures. In such systems an intense development of the interactions at the inter-phase boundaries and a strong tendency to weakening in the second phase itself lead in most cases to heterogenization of the structure having little effect. In systems with a severely limited

S/509/62/000/011/009/019
E071/E351

The relationship between ....

alloying-element solubility in solid magnesium and a small change in the solubility with temperature, the strongest effects of alloying are shown by those with a structure of decomposed solid solution (Mg-Mn, Mg-Th, Mg-Ce, Mg-Nd, Mg-Ca). The appearance in the alloy structure of dispersed particles of heat-resistant secondary phases and the absence of noticeable interaction at the interphase boundaries at elevated temperatures allow heterogenization to exert a strong influence. A comparison of the authors' results and the published data show a correspondence in the nature of the relationships despite the fact that the authors' results were obtained on deformed and heat-treated materials, and the published data were for cast alloys. There are 5 figures.

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DRITS, M.Ye.; SVIDERSKAYA, Z.A.; ROKHLIN, L.L.

Study of the Mg-Nd-Mn alloys in the region adjoining the magnesium angle of the system. Zhur.neorg.khim. 7 no.12: 2771-2777 D '62. (MIRA 16:2)
(Magnesium-neodymium-manganese alloys)

S/279/63/000/001/022/023
E040/E451

AUTHORS: Drits, M.Ye., Sviderskaya, Z.A., Kadaner, E.S., Fel'gina, S.B. (Moscow)

TITLE: Effect of some alloying elements on the recrystallization of magnesium

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i gornoye delo. no.1, 1963, 191-198

TEXT: The effects were studied of the addition of thorium, neodymium, zirconium, nickel and barium on the recrystallization of magnesium, and its relationship with the strengthening and weakening of magnesium alloys at various temperatures. The test alloys were prepared from MI I (MGI)-grade of magnesium (99.91% Mg), electrolytic nickel, barium (99.99% Ba), neodymium (99.9% Nd) and thorium (99.5% Th). The alloying additions were between 0.1 and 2.0 wt.% with Mg-Ba and Mg-Ni alloys, 0.1 and 0.6 wt.% with Mg-Zr alloys, 0.2 and 1.0 wt.% in Mg-Th alloys and from 0.1 to 4 wt.% in Mg-Nd alloys. All the test alloys were hot-deformed, cold-deformed and annealed at temperatures of 50 to 450°C for one hour before microstructural and X-ray examinations, in order to

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Effect of some alloying ...

determine the initial and final temperatures of recrystallization. The experimentally established phase diagrams of the various binary alloys produced from the results are given together with a graph showing the recrystallization kinetics of magnesium-base test alloys. The effect of the alloying elements on the physico-mechanical properties of the test alloys was investigated in detail and the data obtained are tabulated, the effect of each alloying element being examined individually. In most cases, recrystallization of magnesium-base alloys was found to depend mainly on the chemical reaction of the constituents, but the dimensional factor was also found to be prominent in some cases. Soluble alloying elements inhibit the recrystallization of magnesium much more than the insoluble ones but only if the influence of the dimensional factor is appreciable: e.g. 0.1 wt.% addition of zirconium to magnesium was found to have no effect on the recrystallization temperature of magnesium, as in this case the dimensional factor is nil, but a 0.15 wt.% addition of Zr raised the recrystallization temperature of magnesium quite significantly, due to the appearance of a second segregated phase.

Effect of some alloying ...

S/279/63/000/001/022/023
E040/E451

Additions of thorium and neodymium raised the initial recrystallization temperature of magnesium alloys very considerably, and nickel and barium additions to a much smaller extent. The role of recrystallization in weakening magnesium-base alloys at elevated temperatures was examined by creep tests on Mg-Ni specimens carried out for 100 hours at 200°C under a stress of 1.75 kg/mm^2, after prior annealing at 450°C for 1 hour. Hardness tests were carried out on specimens with 0.14% Ni at the test temperature of 125°C. The data obtained are tabulated and their significance is assessed. It is concluded that recrystallization plays an important role in the deformation resistance of Mg alloys at elevated temperatures. There are 6 figures and 3 tables.

SUBMITTED: April 20, 1962

Card 3/3

DRITS, M.Ye.; SVIDERSKAYA, Z.A.; ROKHLIN, L.L.

Effect of plastic deformations on the properties and structure of aging magnesium alloys containing neodymium. Issl. splav. tsvet. met. no.4:157-170 '63. (MIRA 16:8)

(Magnesium alloys—Metallography)
(Deformations (Mechanics))

DRITS, M.Ye. (Moskva); SVIDERSKAYA, Z.A. (Moskva); KADANER, E.S. (Moskva); FEL'GINA, S.B. (Moskva)

Effect of thorium and zinc on the recrystallization of magnesium. Izv. AN SSSR. Met. i gor. delo no.5:129-133 S-O '63. (MIRA 16:11)

SVIDERSKAYA, Z.A.; VASHCHENKO, A.A.

Changes in properties and structure during the annealing of aluminum alloys subjected to plastic deformation between hardening and artificial aging. Issl. splav. tsvet. met. no.4:171-184 '63. (MIRA 16:8)

(Aluminum alloys—Metallography)
(Annealing of metals)

SVIDERSKAYA, Z.A.; KADANER, E.S.; TURKINA, N.I.; KUZ'MINA, V.I.

Boundary of the solid solution region in the aluminum corner of the system aluminum - manganese - lithium. Metalloved. i term. obr. met. no.12:2-6 D'63. (MIRA 17:2)

DRITS, M.Ye.; SVIDERSKAYA, Z.A.; ROKHLIN, L.L.

Constitutional diagrams of the systems magnesium - neodymium, and magnesium - cerium. Trudy Inst. met. no.12:143-151 '63. (MIRA 16:6)

(Magnesium-neodymium alloys—Metallography)
(Magnesium-cerium alloys—Metallography)
(Phase rule and equilibrium)

ZAKHAROV, M.V.; SVIDERSKAYA, Z.A.; DRITS, E.M.; TROKHOVA, V.F.

Effect of tin on the properties of deformable magnesium alloys at room and higher temperatures. Trudy Inst. met. no.12:152-160 '63. (MIRA 16:6)

(Magnesium alloys--Metallography)
(Deformations(Mechanics))

ROKHLIN, L.L.; SVIDERSKAYA, Z.A.; VOLCHKOVA, R.P.

Effect of cold working on the mechanical properties of magnesium alloys with additions of neodymium. Trudy Inst. met. no.12:161-165 '63. (MIRA 16:6)

(Magnesium alloys—Cold working)

ACCESSION NR: AT4009498 S/2509/63/000/014/0120/0129

AUTHOR: Drits, M. Ye.; Sviderskaya, Z. A.; Rokhlin, L. L.

TITLE: Effect of additional alloying elements on the properties of alloys in the Mg-Nd system

SOURCE: AN SSSR. Institut metallurgii. Trudy*, no. 14, 1963. Metallurgiya, metallovedeniye, fiziko-khimicheskiye metody* issledovaniya, 120-129

TOPIC TAGS: alloy, alloy mechanical property, magnesium, neodymium, magnesium alloy, magnesium neodymium alloy, magnesium neodymium manganese alloy, manganese admixture, cadmium admixture, nickel admixture, silver admixture

ABSTRACT: Magnesium-neodymium systems possess very good mechanical properties at temperatures of 200-300C, making them very useful in industry. Previous studies have shown that these properties can be improved further by the addition of zirconium to cast alloys or of elements such as Mn, Ni, Zn and Ag to deformed alloys. The present study dealt with the effect of 13 alloying elements (Cd, Li, Al, Ag, Zn, Pb, Bi, Ca, Mn, Si, Ba, Ni and Co), separately and in combination, on the mechanical properties of deformed Mg-Nd alloys. The alloys were prepared in an electric furnace under a V12 flux. After heat treatment (420-460C), the alloys

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ACCESSION NR: AT4009498

were subjected to hot pressing (88% compression), annealed in air at 535C and aged at 175C for one day. Comparison of the mechanical properties at 250C showed that individual addition of most of these elements to an Mg-Nd alloy containing 2.5% Nd had no significant effect on strength, although Co had some positive effect, the yield point was increased by Cd and Mn, and the ultimate strength was increased by Si. Addition of Al, Sn, Bi or Zn decreased the ultimate strength and yield point at 250C and increased the plasticity. Examination of the microstructure by etching with 0.5% HNO_3 also showed no effect except in the case of Al, Sn or Bi which led to the appearance of a microgranular eutectic resulting from a decrease in the solubility of Nd in Mg; although Zn did not change the microstructure, it decreased the melting point. When Cd, Ag or Ni were added to a Mg-Nd-Mn alloy, the first two had little effect on strength but increased the yield point at room temperature (in the case of Ag, there was no effect at 300C, while at 250C the ultimate strength decreased and the yield point increased); Ni, however, increased the ultimate strength at high temperatures, while at room temperature there was little change in strength and the yield point decreased. Essentially the same effects were produced when Cd or Ag were added to a Mg alloy containing 2.5% Nd, 1.5% Mn and 0.2% Ni, the best properties being obtained with 1.83% Cd. The microstructure of the ternary alloy was unchanged by addition of Cd, but Ag and Ni resulted in the appearance of new phases of Mg_2Ni and Mg_3Ag. "Engineer

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L 23350-65 EWT(m)/EPR/T/EWP(t)/EWP(b) Ps-4 IJP(c) JD/JG/MLK
ACCESSION NR: AT4016821 S/0000/64/000/000/0083/0087

AUTHOR: Drits, M. Ye.; Sviderskaya, Z. A.; Rokhlin, L. L. 87

TITLE: The mechanism of the plastic deformation of magnesium and neodymium alloys under conditions of continuous and short-term tension 27 27

SOURCE: AN SSSR. Nauchnyy sovet po probleme zharoprochnykh splavov. Issledovaniya staley i splavov (Studies on steels and alloys). Moscow, Izd-vo Nauka, 1964, 83-87

TOPIC TAGS: plastic deformation, neodymium alloy, cold hardening, magnesium alloy, coherent scattering, grain boundary, slip band, twin crystal, phase crystal, crystal lattice, alloy microstructure 18

ABSTRACT: The microstructure of magnesium alloy samples with 3% neodymium was investigated at 250 and 300C under short-term and continuous tension conditions. The samples were quenched in water after heating at 535C, subjected to 5% elongation and aged at 200C for 24 hours. The dispersed Mg_9Nd particles were separated from the solid solution after aging. According to X-ray data, the second order tensions in cold-hardened samples after aging of 200C were not removed and the dimensions of the coherent scattering fields were not increased. The microstructure of cold-worked and non cold-worked samples ruptured during short-term tensile

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L 23350-65
ACCESSION NR: AT4046821

tests showed that both had a large number of twins and slip bands inside the grains. The grain boundaries were practically equal, but the Mg_9Nd phase crystals were too fine to be distinguished. The microstructure of samples tested during continuous tension was characterized by the presence of strongly coagulated Mg_9Nd phase crystals; these crystals were particularly coarse after testing at 300C. In the samples cold-worked by hardening and aging, Mg_9Nd crystals were separated out both along the grain boundaries and the twins. During testing under continuous tension, the difference in the plastic deformation of cold-worked and non cold-worked samples consisted in the degree of development of the slip process along the atomic plane of the crystal lattice. When cold-hardening was not carried out, the slipping was significant, while if it was carried out, slipping almost did not occur. Slipping plays a relatively small role in the plastic deformation during continuous tension; therefore, the increase in continuous stability as a result of cold working by hardening and aging is not great. Orig. art. has: 4 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 16Jun64 ENCL: 00 SUB CODE: MM

NO REF SOV: 002 OTHER: 003

Card 2/2

ACCESSION NR: AP4019816 S/0279/64/000/001/0166/0169

AUTHOR: Sviderskaya, Z. A. (Moscow); Kadaner, E. S. (Moscow)

TITLE: Effect of Fe on solubility of Li in Al

SOURCE: AN SSSR. Izv. Metallurgiya i gornoye delo, no. 1, 1964, 166-169

TOPIC TAGS: aluminum alloy, aluminum lithium alloy, lithium alloy, lithium solubility, solid solution solubility, aluminum alloy iron impurity

ABSTRACT: Specimens of binary Al alloys with up to 6% by weight of Li and ternary Al alloys with 0.25-6% Li and 0.04-1.6% Fe were obtained in a resistance furnace (details given) and subjected to subsequent high-temperature treatment (30 hours at 600C, then water quenched; one lot was then kept for 300 hours at 400C, another for 800 hours at 200C, then water quenched). Results are tabulated (see Table 1 in the Enclosure) and indicate that the presence of up to 1.6% Fe in Al-Li alloys has practically no effect on the Li content in the solid solution. The author concludes that the presence of even relatively large amounts of Fe should not exert a negative effect on the hardening of Al-Li alloys during heat treatment. "R. S. Rozhkova and V. Ye. Mogilevskaya took part in the work." Orig. art. has: 2 graphs, 1 table.

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ACCESSION NR: AP4019816

ASSOCIATION: none

SUBMITTED: 10Jun63	DATE ACQ: 31Mar64	ENCL: 01
SUB CODE: ML	NO REF SOV: 003	OTHER: 007

Card 2/3

L 12059-65 EWT(m)/EWP(w)/EWA(d)/EPR/EWP(t)/EWP(b) Ps-4 JD/JG/MLK

ACCESSION NR: AT4046002 S/0000/64/000/000/0272/0278

AUTHOR: Drits, M. Ye.; Sviderskaya, Z. A.; Rokhlin, L. L.

TITLE: Investigation of magnesium-manganese alloys

SOURCE: AN SSSR. Institut metallurgii. Issledovaniya metallov v zhidkom i tverdom sostoyaniyakh (Research on metals in liquid and solid states). Moscow, Izd-vo Nauka, 1964, 272-278

TOPIC TAGS: magnesium manganese alloy, magnesium manganese alloy property, magnesium neodymium alloy, magnesium neodymium alloy property

ABSTRACT: Several magnesium-manganese alloys with a Mn content up to 3% have been investigated as prospective structural materials for service at 400—450C. It was found that the solubility of manganese in magnesium drops with decreasing temperature from 1.9% at 630C to 0.12% at 300C (see Fig. 1 of the Enclosure). The magnesium-manganese solid solution in alloy with 2.5% Mn does not decompose at temperatures below 200C. Aging at 250—275C produces maximum hardness, 60—70 kg/mm^2. At the same time a sharp drop of electric resistivity

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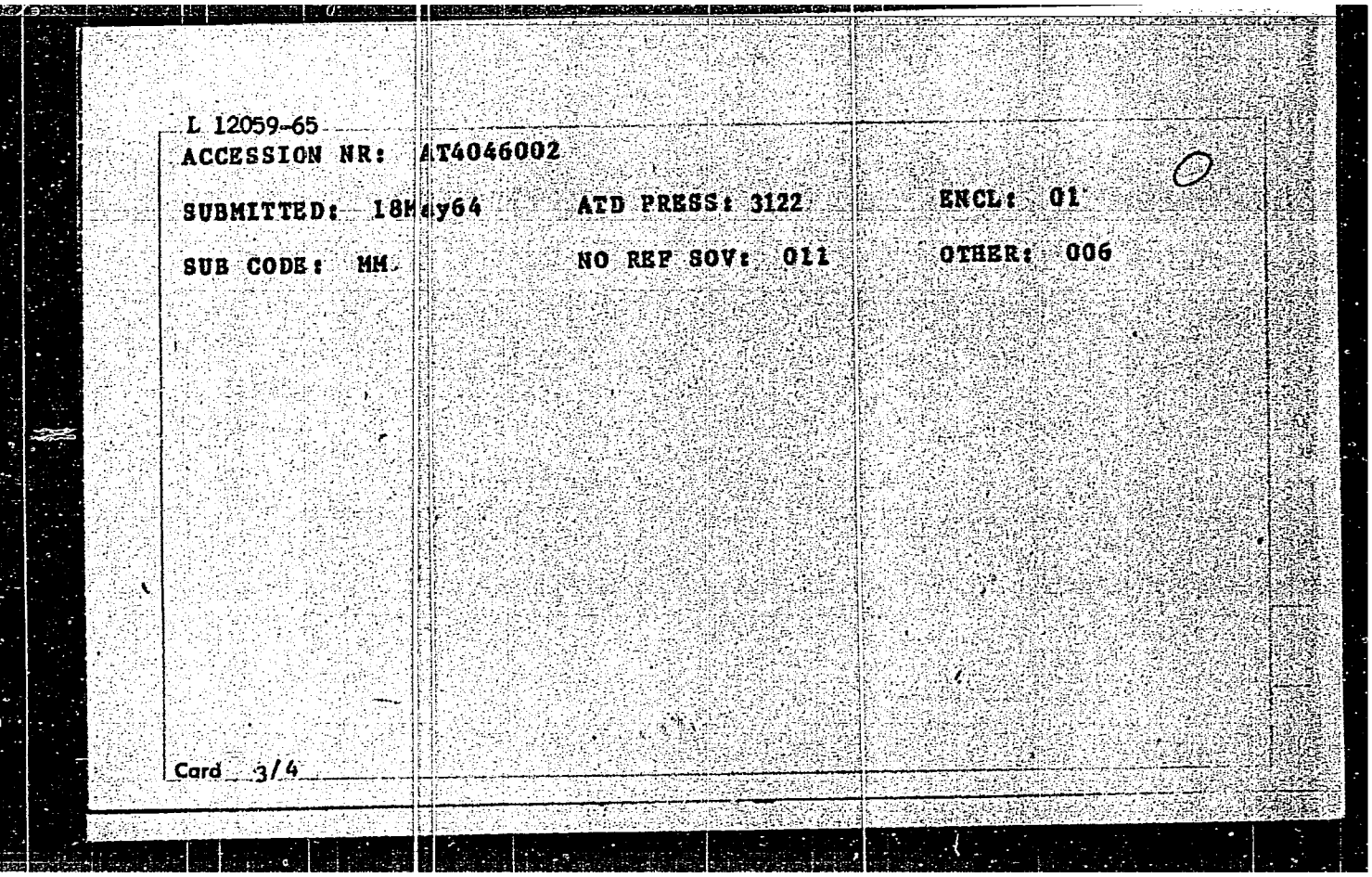
ACCESSION NR: AT4046002

0

occurs. With aging at temperatures over 275C, the hardness decreases and the electric resistivity, after reaching its minimum, begins to rise again. The strengthening phase which precipitates during aging was found to be manganese or a manganese-base solid solution. In an alloy with 2.5% Mn, the decomposition of solid solution occurs at higher temperatures and has a lower strengthening effect than that in a magnesium alloy with 2% Nd. The lower strengthening effect of aging in magnesium-manganese alloys is explained by a lower content of the strengthening phase: 0.44% (by volume) in the magnesium alloy with 2.5% Mn compared to 3.6% in the alloy with 2% Nd. The strength of magnesium alloy with 1.55% Mn at temperatures up to 300—350C, i.e., 8—10 kg/mm^2 at 250C and 7—8 kg/mm^2 at 300C, was found to be lower than that of the Mg-Nd alloy with 2.98% Nd, i.e., 17—18 kg/mm^2 at 250C and 11—12 kg/mm^2 at 300C. At 400C, however, the strengths of both indicated alloys were found to be approximately identical. Orig. art. has: 4 figures and 3 tables.

ASSOCIATION: none

Card 2/4



L 12059-65
ACCESSION NR: AT4046002

SUBMITTED: 18May64 ATD PRESS: 3122 ENCL: 01

SUB CODE: MM NO REF SOV: 011 OTHER: 006

Card 3/4

L 12059-65

ACCESSION NR: AT4046002

ENCLOSURE: 01

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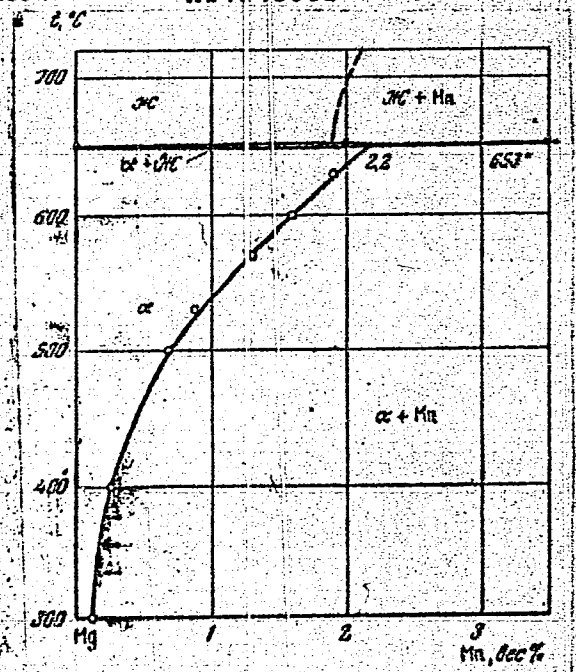

Fig. 1. Phase diagram of the Mg-Mn alloy

o - solubility of manganese in magnesium in solid state
d - thermal analysis data

Card 4/4

SVIDERSKAYA, Zoya Andreyevna; ROKHLIN, Lazar' Leonovich; DRITS, M.Ye., doktor tekhn. nauk, otv. red.; CHERNOV, A.N., red.

[Magnesium alloys containing neodymium] Magnievye splavy, soderzhashchie neodim. Moskva, Nauka, 1965. 137 p. (MIRA 18:7)

L 45463-65 EFR/EWP(k)/EWP(z)/EWA(c)/EWT(m)/EWP(b)/EWA(d)/EWP(t) Pf-4/Ps-4
IJP(c) MJW/JD/HW
ACCESSION NR: AP5009273 UR/0370/65/000/001/0160/0165

AUTHOR: Sviderskaya, Z. A. (Moscow); Rokhlin, L.L. (Moscow); Gur'yev, I.I. (Moscow); Oreshkina, A.A. (Moscow)

TITLE: Influence of plastic deformation between the operations of quenching and aging on the properties and structure of magnesium alloy MA5

SOURCE: AN SSSR. Izvestiya. Metally, no. 1, 1965, 160-165

TOPIC TAGS: magnesium alloy, aluminum containing alloy, plastic deformation, alloy strength, alloy heat treatment, alloy structure, alloy plasticity, work hardening, alloy conductivity

ABSTRACT: The authors studied the possibility of using plastic deformation between quenching and aging for the purpose of raising the strength characteristics of alloy MA5 (7.5-9.3% Al, 0.2-0.8% Zn, 0.5% Mn, impurities no more than 0.25% Si, 0.15% Cu, 0.15% Fe, bal. Mg). Quenching was done from 415C by cooling in air; the plastic deformation consisted of the extension of special blank specimens from which samples were made for tensile tests. It was found that plastic deformation between quenching and aging produces a definite increase in strength characteristics, but at the expense of a decrease in plasticity. Changes in the structure

Card 1/2

L 45463-65

ACCESSION NR: AP5009273

of MA5 due to the deformation were studied by measuring the electrical resistance, by observing the microstructure, and by the x-ray method. A comparison of the results of mechanical tests and structural studies shows that the hardening of alloy MA5 by plastic deformation is due mainly to the formation of crystal lattice distortions which are characteristic of the work-hardened state. The decrease in hardening associated with a rise in the aging temperature or testing temperature is due to a partial elimination of these distortions, as was shown by x-ray analysis. Orig. art. has: 5 figures.

ASSOCIATION: None

SUBMITTED: 18Mar64 ENCL: 00 SUB CODE: MM

NO REF SOV: 014 OTHER: 000

Card 2/2 mb

L 54498-65 EWT(m)/EPR/T EWP(t)/EWP(b)/EWA(c) Ps-4 IJP(c) JD/JW
ACCESSION NR: AP5013118 UR/0370/65/000/002/0147/0152
669.017.3

16
15
8

AUTHOR: Sviderskaya, Z. A.; Trokhova, V. F.

TITLE: Recrystallization of Mg-Li alloys

SOURCE: AN SSSR. Izvestiya. Metally, no. 2, 1965, 147-152

TOPIC TAGS: recrystallization, magnesium alloy, lithium alloy, metallography

ABSTRACT: The authors investigated the effect of 0.2-18 at % (0.006-6 wt %) lithium on the recrystallization temperature of magnesium cold deformed 60% in a hydraulic press and reheated to temperatures between 50-250°C. X-ray (appearance of the first spot on the Debye ring) and metallographic (appearance of first recrystallized grain) examinations were used to map the onset of recrystallization. The disappearance of the last traces of cold worked structure under metallographic examination and the complete breakdown of Debyé rings into spots signified the end of recrystallization. A noticeable increase in recrystallization temperature occurs only with the addition of 6-7% Li although even with an 18% Li addition the recrystallization temperature is raised only 45°C compared with pure magnesium. The

Card 1/2

L 54498-65
ACCESSION NR: AP5013118

curves for log of time to beginning of recrystallization versus reciprocal of the temperature of annealing for the 0.0, 0.2, 3.3, and 6.8% specimens gave straight lines and equal slopes for the latter three alloys indicating a constant activation energy for the process. The activation energy for pure Mg was found to be higher. The high activity of lithium or the lowered energy of grain boundary surfaces due to Li concentration is offered as an explanation for the relative reduction in recrystallization temperature for small additions of lithium. Orig. art. has: 3 figures, 1 table.

ASSOCIATION: none

SUBMITTED: 01Jun64 ENCL: 00 SUB CODE: MM

NO REF SOV: 015 OTHER: 004

Card 2/2

L 5375-66 EWT(m)/EWP(t)/EWP(b) IJP(c) JD/JG

ACC NR: AP5027095 UR/0149/65/000/005/0101/0107

669.721

54
50
03

AUTHOR: Drits, M. Ye.; Sviderskaya, Z. A.; Trokhova, V. F.
44,55 44,55 44,55

TITLE: Properties of lithium-containing magnesium alloys
27 44,55, 27

SOURCE: IVUZ. Tsvetnaya metallurgiya, no. 5, 1965, 101-107

TOPIC TAGS: lithium containing alloy, magnesium base alloy, crystal lattice, hardness, tensile strength, compressive strength, plasticity

ABSTRACT: Alloying Mg with Li produces alloys of a density lower than that of the normally used Mg alloys (1.3-1.6 g/cm^3). Moreover, when the Li content exceeds 11%, the close-packed hexagonal lattice of Mg changes to a body-centered cubic lattice, thus assuring an exceptional suitability for pressworking. The available literature indicates that the properties of these alloys are greatly affected by the purity of starting materials, and particularly by the Na content (an impurity of Li), as well as by the conditions of the preparation and processing of the alloys. This complicates a comparison of the findings of individual investigators, particularly since the conditions under which the alloys are obtained are not always reported. To fill this gap, the authors investigated the properties of binary and certain ternary Li-containing Mg alloys prepared under fixed conditions from Mg (99.1% pure), electrolytic Li (99.7% pure, containing 0.15-0.20% Na), A00 Al (99.7% pure), and KDO Cd (99.97%
18 18

Card 1/3

09010295

pure). Depending on the amount of Li added, the Na content of the alloys varied from 0.01 to 0.04%. The specimens for mechanical tests were prepared from hot-pressed rods. On alloying Mg with Li, the hardness of the alloys increases until the two-phase region $\alpha + \beta$ is attained (5-7% Li). As the Li content is further increased, transition to the β-solid solution region takes place and, in alloys with 12-14% Li, the hardness falls below the hardness of pure Mg. The presence of Li in the alloys hardens them to a comparatively small extent (at 5-7% Li the hardness is only 5-6 kg/mm^2 higher than the hardness of Mg). The same may be said of the effect of Li on compressive and tensile strength of the alloys: the values of this strength are somewhat higher than for pure Mg when the Li content is 3-7% (when the alloys have a two-phase structure), but they decrease once transition to the β-phase region takes place. If the Li content is below 3%, the structure of the alloys is an α-solid Mg-base solution. This pattern is to a large extent offset in ternary Mg alloys where the presence of Al or Cd as the third alloy element markedly enhances the hardness and the tensile and compressive strength, particularly when Al is used. The best combination is that of alloys containing 2-5% Li and 5-10% Al, as then tensile strength is 27-33 kg/mm^2 and yield point = 17-22 kg/mm^2. Allowance must be made, however, for the adverse effect of Al on the plasticity of the alloys, due to the appearance of brittle intermetallic phases in their structure. Evidently, the optimal content of Al must be determined on taking into account the concentration of Li and other alloy elements, as well as the

L 5375-66

ACC NR: AP5027095

3

presence of impurities. Orig. art. has: 5 figures, 2 tables.

ASSOCIATION: Institut metallurgii im. A. A. Baykova (Baykov Institute of Metallurgy)

44,55

SUBMITTED: 18Jun64 ENCL: 00 SUB CODE: MM, SS

NO REF SOV: 003 OTHER: 011

Card 3/3

L 37169-66 EWT(m)/T/EWP(t)/ETI LJP(c) JH/JG/GD/JD

ACC NR: AT6016419 (A) SOURCE CODE: UR/0000/65/000/000/0125/0134

AUTHORS: Drits, M. Ye.; Sviderskaya, Z. A.; Gur'yev, I. I.; Rokhlin, L. L.; Oreshkina, A. A.

ORG: none

TITLE: Influence of temperature on the mechanism of plastic deformation of magnesium and magnesium alloy containing 3% neodymium

SOURCE: AN SSSR. Institut metallurgii. Metallovedeniye legkikh splavov (Metallography of light alloys). Moscow, Izd-vo Nauka, 1965, 125-134

TOPIC TAGS: magnesium, magnesium alloy, neodymium containing alloy

ABSTRACT: The effect of temperature and additions of neodymium on the mechanism of plastic deformation of magnesium was investigated. The investigation supplements the results of Ye. M. Savitskiy, V. F. Terekhova, I. V. Burov, I. A. Markova, and O. P. Naumkin (Splavy redkozemel'nykh metallov. Izd-vo AN SSSR, 1962). The magnesium specimens were annealed at 425—450C for one hour. Specimens containing 3% neodymium were heated to 535C, quenched in water, and aged at 200C for 8 hours. The microstructure of the specimens was studied as a function of the annealing temperature and degree of deformation. The nature of the plastic deformation is different at high temperatures compared with low temperatures. The addition of 3% Nd to magnesium shifts the transition of the low-temperature plastic deformation mechanism to the

Card 1/2

L 37168-66 EWT(m)/EWP(w)/T/EWP(t)/ETI IJP(c) JD/JG/GD/JH

ACC NR: AT6016420 (A) SOURCE CODE: UR/0000/65/000/000/0135/0144

AUTHORS: Sviderskaya, Z. A.; Vashchenko, A. A. 39

ORG: none

TITLE: Influence of plastic deformation on the properties of aging alloys of the system aluminum--copper--lithium

SOURCE: AN SSSR. Institut metallurgii. Metallovedeniye legkikh splavov (Metallography of light alloys). Moscow, Izd-vo Nauka, 1965, 135-144

TOPIC TAGS: aluminum containing alloy, copper containing alloy, lithium containing alloy

ABSTRACT: The effect of intermediate deformation (between annealing and aging) on the mechanical properties, electrical resistance, microstructure, and lattice parameter of aluminum--copper--lithium alloys containing 2--3% Cu and sufficient lithium to form the compound Al_2CuLi were investigated. The investigation supplements the results of H. K. Hardy and J. M. Silcock (The Phase Sections at 500° and 350° of Aluminum-rich Aluminum-Copper-Lithium Alloys. - J. Inst. Metals, 1955--1956, 84, 423). The experimental results are summarized in graphs and tables (see Fig. 1). Cold intermediate deformation between annealing and aging of Al-Cu-Li alloys leads to a considerable increase in their mechanical properties. However, the increase in mechanical

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L 37168-66

ACC NR: AT6016420

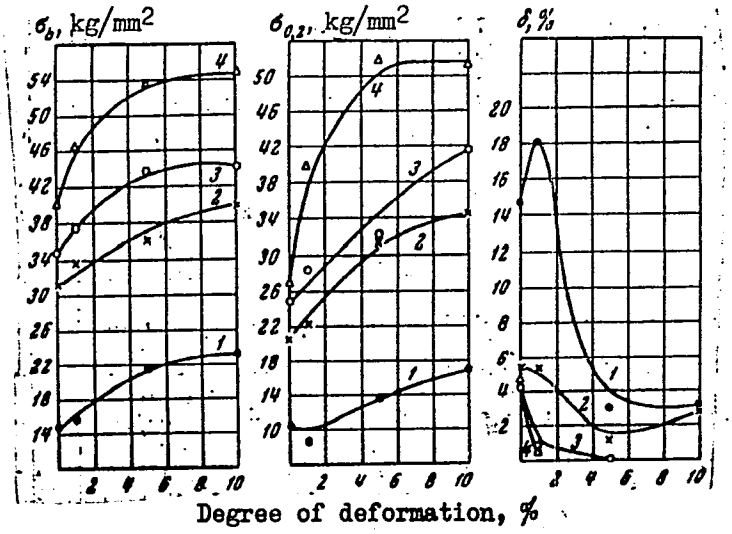

Fig. 1. Mechanical properties of different Al-Cu-Li alloys as a function of the degree of cold deformation.

Curve	Composition, %	
	Cu	Li
1	2	0.22
2	4	0.43
3	6	0.65
4	8	0.87

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L 37168-66

ACC NR: AT6016420

properties disappears for highly alloyed specimens when they are exposed for short periods of time to relatively low temperatures (150--200C). It is concluded that the deformation enhances the diffusion processes in the alloys which in turn cause a weakening of the alloy structure. Orig. art. has: 2 tables and 7 figures.

SUB CODE: 11/ SUBM DATE: 16Sep65/ ORIG REF: 010/ OTH REF: 002

Card 3/3 af

DRITS, M.Ye., doktor tekhn. nauk, otv. red.; BOCHVAR, A.A., akademik, red.; BELOV, A.F., doktor tekhn. nauk, red.; DOBATKIN, V.I., doktor tekhn. nauk, red.; MAL'TSEV, M.V., doktor tekhn. nauk, red.; FRIDLYANDER, I.N., doktor tekhn. nauk, red.; SVIDERSKAYA, Z.A., kand. tekhn. nauk, red.; YELAGIN, V.I., kand. tekhn. nauk, red.; BARBANEL', R.I., kand. tekhn. nauk, red.; SHAROV, M.V., kand. tekhn. nauk, red.; KADANER, E.S., kand. tekhn.nauk, red.; TROKHOVA, V.F., red.; CHERNOV, A.N., red.

[Metallography of light alloys] Metallovedenie legkikh splavov. Moskva, Nauka, 1965. 226 p. (MIRA 18:10)

1. Moscow. Institut metallurgii.

L 46768-66 EWP(a)/EWP(w)/T/EWP(t)/ETI IJP(c) JD/WW/JG/JH

ACC NR: AP6031721 (A) SOURCE CODE: UR/0370/66/000/005/0125/0131

AUTHOR: Drits, M. Ye. (Moscow); Sviderskaya, Z. A. (Moscow); Yelkin, F. M. (Moscow)

ORG: none

TITLE: Effect of additional alloying on the structure and properties of beta-phase magnesium-lithium alloys

SOURCE: AN SSSR. Izvestiya. Metally, no. 5, 1966, 125-131

TOPIC TAGS: magnesium lithium alloy, aluminum containing alloy, zinc containing alloy, copper containing alloy, rare metal containing alloy, silver containing alloy, alloy structure, alloy property, MAGNESIUM BASE ALLOY, LITHIUM CONTAINING ALLOY, SOLID MECHANICAL PROPERTY

ABSTRACT: The effect of lithium and some other alloying elements on the structure and properties of magnesium-base alloys has been investigated. It was found that the mechanical properties of binary magnesium-lithium alloy remain unchanged with lithium content varied within 10—20%. The hot extruded alloys have high ductility, 40—50% elongation, but a tensile strength of only 9—11 kg/mm^2 and a yield strength of 6—7 kg/mm^2. In the as-cast condition, the alloy has a uniform coarse-grained structure of solid solution with grain size decreasing as lithium content increases from 10% to 20%. Aluminum added in the amount of 1.5% to magnesium-14% lithium alloy raises the tensile strength to 22—23 kg/mm^2, the yield strength to 20—22 kg/mm^2, and the hardness to 60—70 kg/mm^2, but reduces elongation to 10—15%; zinc, silver, copper

Card 1/2 UDC: 669.721.5'884

34778-66 EWT(m)/[illegible](w)/T/EWP(t)/ETI IJP(c) JD/HW/JG

ACC NR: AP6020742 SOURCE CODE: UR/0136/66/000/006/0083/0085

AUTHOR: Drits, M. Ye.; Sviderskaya, Z. A.; Yelkin, F. M.

ORG: none

TITLE: Effect of alloying on the structure and properties of Mg-Li alloys containing aluminum

SOURCE: Tsvetnyye metally, no. 6, 1966, 83-85

TOPIC TAGS: magnesium alloy, lithium containing alloy, aluminum containing alloy, tin containing alloy, silver containing alloy, copper containing alloy, nickel containing alloy, calcium containing alloy, barium containing alloy, bismuth containing alloy, neodymium containing alloy, alloy property

ABSTRACT: An attempt has been made to improve and stabilize the mechanical properties of Mg—14% Li—1.5% Al alloy by additional alloying with Ca, Bi, Ba, Ni, Nd, Ce, La, Cu, Sn and Ag. Roughly machined alloy ingots were extruded at 200C with a reduction of 88% and tested for structure and mechanical properties. The test results showed that the structure of cast Mg—14% Li—1.5% Al alloy had a coarse-grained β-phase, which partly recrystallized with extrusion. The majority of quaternary alloys in the as-cast condition had a finer structure than the ternary alloys, while extruded alloys had a partly recrystallized structure with precipitation of a secondary phase.

UDC: 669.721'884:620.1

Card 1/3

L 34778-66

ACC NR: AP6020742

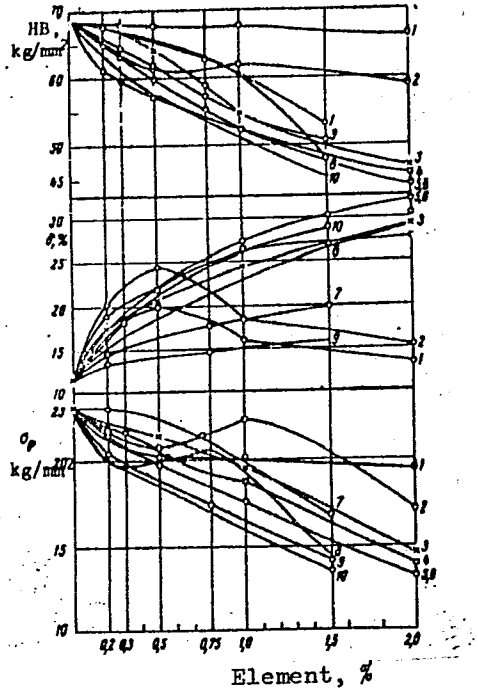


Fig. 1. Dependence of the mechanical properties of hot-extruded Mg—14%Li—1.5%Al alloy on the content of alloying elements

1 - Ag; 2 - Sn; 3 - Nd; 4 - Cu; 5 - La; 6 - Ce; 7 - Ba; 8 - Bi; 9 - Ca; 10 - Ni.

Card 2/3

L 07365-67 EWT(m)/EWP(w)/EWP(t)/ETI IJP(c) JD/JG/JH

ACC NR: AP6033619 SOURCE CODE: UR/0136/66/000/010/0077/0081

AUTHOR: Drits, M. Ye.; Sviderskaya, Z. A.; Trokhova, V. F.

ORG: none

TITLE: Effect of chemical composition on properties of Mg-Li alloys

SOURCE: Tsvetnyye metally, no. 10, 1966, 77-81

TOPIC TAGS: magnesium lithium alloy, alloy composition, ~~alloy~~ metal property, alloy structure

ABSTRACT: The properties of binary magnesium-base alloys containing 0—12% lithium, melted from 99.91%-pure magnesium and 99.96%-pure lithium (to eliminate the effect of sodium), were determined in the hot-extruded or annealed (at 500C for 50 hr) conditions. It was found that lithium content increased the resistivity up to 12%: from 4.6 to 14.4 μ·ohm·cm for both hot-extruded and annealed specimens. With lithium content increased to 5%, microhardness increased from about 50 to 58 kg/mm^2 but dropped by 6—8 kg/mm^2 with further increase of lithium content. The density of alloys decreased with increasing lithium content from 1.74 g/cm^3 for pure magnesium to 1.39 g/cm^3 for alloy with 12% lithium. The tensile strength of hot-extruded alloy with 12% lithium (β-phase) dropped more than 50% and the elongation increased 8 times compared to those of pure magnesium. Annealing lowered the tensile strength of pure magnesium from 21 to 10 kg/mm^2; annealed alloys containing up to 10% lithium

Card 1/2 UDC: 669.721'884:620.1

L 22365-67

ACC NR: AP6033619

have a tensile strength 2—7 kg/mm^2 higher than pure magnesium. The elongation of annealed alloys with 1—5% or over 10% lithium is lower than that of hot-extruded alloys. In two-phase alloys (5—10% Li), no difference is observed. The yield strength of hot-extruded or annealed alloys follows the same pattern as the tensile strength. Hot-extruded magnesium has a fine-grained structure; alloys containing over 10% lithium have a coarse-grained structure. Lithium has little or no effect on the recrystallization process. The β-phase appears in hot-extruded alloys at 3% lithium and is present in considerable amounts in alloys with 5% lithium. The structure of alloy with 6—9% lithium consists of α and α + β eutectic. Alloys containing over 10% lithium have a homogeneous structure of β-solid solution. The alloys containing more than 3% lithium have a tendency to soften under stresses at temperatures as low as 60—100C. The rupture strength of alloys with 9—12% lithium is 80% lower than that of pure magnesium. Only in alloy containing 2% magnesium is the rupture life higher than in pure magnesium. Orig. art. has: 2 figures.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 004/ OTH REF: 002/ ATD PRESS: 5101

Card 2/2 afs

ACC NR: AP5025169

SUB CODE: 11/ SUBM DATE: 26Apr65/ ORIG REF: 114/ OTH REF: 059/

Card 2/2

ACC NR: AP6036443 SOURCE CODE: UR/0370/66/000/006/0114/0120

AUTHORS: Drits, M. Ye. (Moscow); Sviderskaya, Z. A. (Moscow); Rokhlin, L. L. (Moscow)

ORG: none

TITLE: Effect of alloying and of thermal treatment on the extinction of ultrasonic vibrations in magnesium alloys

SOURCE: AN SSSR. Izvestiya. Metally, no. 6, 1966, 114-120

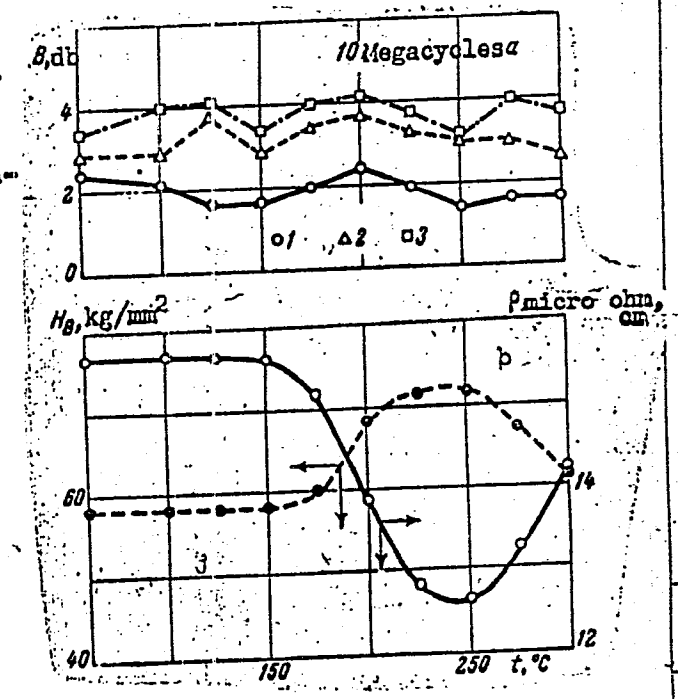
TOPIC TAGS: magnesium alloy, calcium ~~containing~~ alloy, rare earth ~~containing alloy~~, ultrasonic vibration, ultrasound absorption

ABSTRACT: The effect of adding calcium and mischmetal (98% rare earth metals containing 46% Ce), respectively, to magnesium on the scattering and extinction of supersonic waves in the alloy was determined. In addition, the effect of different thermal treatments of the alloy on the extinction of supersonic vibrations was investigated. The study supplements the results of D. P. Lovtsov, V. P. Sizov, and A. G. Spasskiy (Vliyaniye usloviy lit'ya na zatukhaniye ul'trazvuka v metallakh. Izv. VUZov, Tsvetnaya metallurgiya, 1958, No. 3, 127). The alloy specimens were prepared after the method of Lavrov. A schematic of the experimental installation for the determination of ultrasonic absorption is presented. The microstructure, hardness, and electrical resistance of the specimens were correlated with the ultrasonic absorption of the latter, and the experimental results are presented graphically (see Fig. 1).

 UDC: 669.721.5

ACC NR: AP6036443

Fig. 1. Dependence of the extinction of ultrasound (a), hardness and specific electrical resistance (b), respectively, of alloy Mg + 8% Al on the aging temperature (initial state—after quenching); length of specimen during ultrasonic extinction measurements: 1 - 50, 2 - 85, 3 - 125 mm



Card 2/3

SVIDERSKAYA, Z.I.

Case of food poisoning caused by honey. Gig. i san. 24 no.5:57 My '59.
(MIRA 12:7)

1. Iz Krasnodarskoy krayevoy sanitarno-epidemiologicheskoy stantsii.
(HONEY,
pois., by atropine-containing honey (Rus))
(FOOD POISONING,
same)
(ATROPINE, pois.
by honey containing atropine (Rus))

SVIDERSKIY, G. D., inzhener.

The Arctic in the home. Tekh.mol.22 no.2:28-30 F '54. (MLRA 7:2)
(Refrigeration and refrigerating machinery)

KRUGLYAK, Iosif Naumovich; SVIDERSKIY, Georgiy Danilovich; BERLYANT, I.Ya., red.; ZAYTSEVA, L.A., tekhn.red.

[Maintenance and repair of refrigerators] Remont domashnikh kholodil'nikov. Moskva, Vses.kooper.izd-vo, 1959. 238 p. (MIRA 12:8)

(Refrigerators--Maintenance and repair)

KRUGLYAK, I.N.; SVIDERSKIY, G.D.; SHELYUTTO, Ye.P., red.;
KHARITONOVA, L.I., tekhn. red.

[Repair of household refrigerators]Remont domashnikh kholodil'nikov. Izd.2., perer. i dop. Moskva, Gosmestpromizdat, 1961. 279 p. (MIRA 15:12)
(Refrigerators--Maintenance and repair)

S/130/61/000/003/002/008
A006/A001

AUTHORS: Kudrin, V.A., Vinnichenko, Ye.V., Sviderskiy, G.V., Tunkov, V.P., Sokolov, O.N.

TITLE: Processing of Liquid Steel With Solid Synthetic Mixtures

PERIODICAL: Metallurg, 1961, No. 3, pp. 16 - 17

TEXT: A series of experimental heats were carried out on furnaces of an open-hearth shop at the "Serp i molot" plant. The investigation was made for the purpose of revealing the possibility and expediency of treating steel with solid synthetic mixtures. The following composition of a desulfurizing mixture was selected (in %): Freshly burnt lime 70 - 75; fluorspar 25 - 28; crushed aluminum 0 - 4. The consumption was 8 - 11 kg/ton of steel. The components of the mixture were crushed manually, and fluorspar was preheated in a mold. The mixture was supplied to the metal jet when leaving the furnace, partly from a bin with 45% ferrosilicon, partly by hand. Data given in Table 1 show that the sulfur content was reduced by 28% on the average, after treating the metal with the synthetic mixture, in relation to the sulfur content prior to that. Desulfurization process is somewhat intensified at a higher carbon content. An analysis of results ob-

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Processing of Liquid Steel With Solid Synthetic Mixtures

tained from the experiments has shown that the content of non-metallic impurities in the metal that was treated with the mixture or not treated, is equal. CaO was not revealed in the impurities. An analysis of the experimental heat metal, as to the hydrogen content depending on the moisture of the mixture, shows that a moisture up to 1.5% H_2O, does practically not affect the hydrogen content in the metal. Results of mechanical tests are given in Table 2. It was found that the efficiency of open hearth furnaces can be raised by 10-15% when treating high-quality instrument steel with synthetic mixtures. This is due to a reduced bubbling time required to assure metal desulfurization in heats of conventional technology. The cost price of steel is correspondingly reduced by 2 - 2.5%. The degree of desulfurization depends only slightly on the sulfur content in the ladle prior to treatment. It decreases in the case when the heat is teemed at the lowest metal temperature limit for the given jet, to prevent metal splashing in case that components of higher moisture should fall into the ladle. Supply of the mixture should be started after teeming into the ladle about one fourth of the heat; it should be completed prior to the formation of slag. The mixture can not be supplied to the ladle bottom prior to teeming the heat, because of safety conditions.

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S/130/61/000/003/002/008
A006/A001

Processing of Liquid Steel With Solid Synthetic Mixtures

Table 1

Results of chemical analyses of samples and the degree of desulfurization

Number of Heat (Номера плавок)	Steel (Сталь)	Content, % (Содержание, %) C	Mn	P	Content, % (Содержание S) Prior to treatment (До обработки)	After treatment (После обработки)	Desulfurization degree, % (Степень обессеривания, %)
54468	У12А	1,22	0,18	0,008	0,027	0,018	33,4
54477	У8А	0,87	0,26	0,008	0,020	0,015	25,0
54528	У8А	0,85	0,24	0,010	0,020	0,012	40,0
54577	У8А	0,85	0,25	0,010	0,024	0,018	25,0
63109	У8А	0,72	0,23	0,010	0,025	0,018	25,0
63135	У10А	0,95	0,19	0,010	0,028	0,020	28,6
54697	Ст. 5	0,37	0,56	0,010	0,030	0,023	23,4
54700	У12А	1,15	0,20	0,010	0,024	0,018	25,0
54761	20	0,17	0,40	0,012	0,030	0,024	20,0
54777	20	0,18	0,47	0,012	0,037	0,030	19,0
54804	20	0,17	0,65	0,016	0,037	0,025	32,4
54808	40	0,39	0,34	0,018	0,038	0,026	31,6
63257	У8А	0,82	0,18	0,010	0,030	0,019	36,8
63262	20	0,23	0,54	0,010	0,036	0,028	22,8

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Processing of Liquid Steel With Solid Synthetic Mixtures

Table 2: Mechanical properties of the metal

Heat	Ultimate strength kg/mm^2	Yield limit kg/mm^2	Relative elongation %	Relative constriction %
Treated with mixture	48,1	38,0	31,4	63,2
Non-treated	48,2	36,0	29,4	59,6

There are 2 tables.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute), Zavod "Serp i Molot" ("Serp i molot" Plant)

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SVIDERSKIY, K.D.

The replacement of disc valves by hydraulic seals. Stek.i ker. 13 no.6:23-24 Je '56. (MLRA 9:8)
(Valves) (Gas producers)

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